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Résumé de l'article

A la fin du XIX^{e} siècle, en France, trois sortes d'écoles dispensent l'enseignement secondaire tel qu'on l'entend aujourd'hui, soit les lycées et collèges, les écoles primaires supérieures et les écoles à vocation plutôt professionnelle. Ces dernières se divisent également en trois catégories — Ecoles pratiques, Ecoles professionnelles et Ecoles d'arts et métiers — et ce sont elles qui constituent l'objet de cette recherche.

L'auteur s'arrête d'abord à la période d'avant la première guerre mondiale, c'est-à-dire aux années 1880-1914, puis il s'attarde plus longuement à la période de l'entre-deux-guerres. On nous renseigne sur la formation professionnelle des ouvriers qualifiés et des cadres techniques pendant ces deux décennies; on élabore sur les liens qui s'établissent entre ces écoles, le gouvernement et l'industrie; on établit enfin un bilan du progrès réalisé dans l'enseignement professionnel tout au long de cette période. Restent les années de l'après-guerre et l'auteur esquisse à grands traits les divers changements qui se sont produits dans ces institutions depuis 1945.

Technocracy or Democracy? Technical High Schools and the Question of Secondary School Reform in France, 1918-1947 *

C.R. DAY

Among the comfortable certainties of nineteenth-century life was an educational structure as logical as it was simple: the primary schools taught the three R's and religion to the common people; secondary education existed separately to teach the classics and good manners to future elites; and higher education provided specialized knowledge in medicine, law, theology, and engineering for those who needed it. In France this system was put into place early in the nineteenth century by Napoleon, who created the highly centralized public education corporation, the *Université*, and its network of *lycées* and *collèges*. Under the July Monarchy, in 1833, a national system of primary schools was established.

What quickly ruined the symmetry of the educational pyramid was the need for middling specialists and managers of various kinds who had to be trained in post-elementary schools. It was necessary, for example, to train teachers and to prepare foremen and managers to supervise workers and clerks — tasks of lesser leadership too tiresome to concern the bourgeoisie and too important to put into politically unreliable lower class hands. Thus the Law on Primary Education of 1833 set up teacher-training colleges and higher primary schools for the petty bourgeoisie who wanted a more advanced education for their sons than the elementary schools could offer, but who did not have the time and money to pursue seven to ten years of classical studies in the *lycées* and *collèges*. Fifty years later, the Ferry Laws rendered primary education compulsory and free and greatly expanded the higher primary schools, creating also a number of higher primary technical and vocational schools called *Ecoles pratiques de commerce et d'industrie* and *Ecoles nationales professionnelles*.

Thus by the end of the nineteenth century, there were three kinds of intermediate schools, each with its own programmes, diplomas, faculty, clientele, and professional goals: the classical lycées and collèges, the higher primary schools (*écoles primaires supérieures*), and the intermediate technical schools. This paper is about these intermediate technical schools, the *Ecoles pratiques*, the *Ecoles professionnelles*, and the *Ecoles d'arts et métiers*, during the interwar period. To understand their history, one must also understand their relationship to the other secondary schools and to the educational politics of the period. As the Third Republic seldom provided any leadership in education during these years, schools

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and institutions tended to fall back on the protection of their vested interests. The result was that technical education made scant progress until the decade of 1938 to 1947 ushered in a period of reform.

Before entering into a discussion of the politics of technical education during the interwar years, one might first discuss the tripartite organization of secondary education that had emerged by the latter decades of the nineteenth century. The oldest and best known of the French secondary schools, the lycées and collèges, trained the sons of the bourgeoisie in the classics and theoretical mathematics for the universities and ultimately for the liberal professions and upper civil service. They had their own primary annexes to assure that they did not have to recruit from the socially inferior primary schools. In practice, however, the Catholic boarding schools got the cream of the bourgeois crop, leaving only the sons of civil servants, professors, and teachers, and of Protestants, Jews and other outsiders, as a dependable source of students. The big-city lycées managed to prosper with this clientele, but the local colleges (*collèges communaux*) needed various kinds of modern, non-classical programmes in order to survive, for example, Victor Duruy's *l'enseignement secondaire spécial* and the modern *baccalauréat* option introduced in 1902. Generally, male secondary school enrolments stagnated from the 1880s to the 1930s.[1]

The modern programme introduced in the lycées and collèges overlapped with those of the five hundred or so higher primary schools. The emphasis was on applied science and mathematics, history, geography, and French, rather than on classical languages, in preparation for lesser supervisory tasks in business, industry, agriculture, and the civil service. But the collèges did not have the appeal of the higher primary schools. The popularity of the latter derived from their close ties with the primary system. Their teachers came from the normal schools, their programmes were flexible and oriented to the needs of the community, in contrast to the rigid programmes and the centralized structure of secondary and higher education, and they were more numerous in rural areas than the lycées and collèges. Moreover, primary school teachers in larger towns taught a post-elementary *cours complémentaire* which was closely linked to the programme of the higher primary schools. Thus teachers and parents alike preferred these schools because of their proximity, their flexibility, and their professional orientation.[2]

But their very popularity made them vulnerable to the ambitions of their neighbours, the collèges and the technical high schools. Intermediate technical education in France dated to the time of Napoleon and the creation of the first

1. Antoine Prost, *L'Enseignement en France 1800-1967* (Paris: A. Colin, 1968), pp. 245-69; C.R. Day, "Technical and Professional Education in France: the Rise and Fall of L'Enseignement Secondaire Spécial, 1865-1902", *Journal of Social History*, VI (Winter 1972-73), pp. 177-201.
2. C.R. Day, "Education for the Industrial World: Technical and Modern Instruction in France under the Third Republic: 1870-1914", in Robert Fox and George Weisz, eds., *The Organization of Science and Technology in France 1808-1914* (Cambridge, England: Cambridge University Press, 1980), pp. 127-53.

two Ecoles d'arts et métiers at Châlons-sur-Marne in 1803 and Angers in 1811. A third was established at Aix-en-Provence in 1843, and three more at Lille (1900), Cluny (1901), and Paris (1912). Just below them in status were the Ecoles pratiques and Ecoles professionnelles established by the Third Republic in the 1880s with a clear vocational and industrial orientation.[3] For a time they were jointly administered by the Ministry of Industry and Commerce and the Ministry of Public Instruction, but in 1892 and 1900 they were placed exclusively under Commerce. A strong lobby associated with this ministry proceeded to argue for the transformation of all higher primary schools into Ecoles pratiques under the jurisdiction of the Commerce Ministry.[4] Some higher primary schools having a professional orientation were in fact converted to Ecoles pratiques, but generally the system remained intact under the Ministry of Public Instruction until 1943. Indeed, in 1920 most of the schools under Commerce, including the Ecoles pratiques, the Ecoles professionnelles, and the Ecoles d'arts et métiers, were transferred to the Ministry of Public Education, though they kept their own identity under a special technical education division of that ministry.[5]

During the interwar period, thirty-five professional sections of higher primary schools were converted into Ecoles pratiques. Half the growth of the latter during this period came from such conversions. In 1914, the Ecoles pratiques had fifteen thousand students; in 1938 they had almost sixty-five thousand students.[6] In addition to the efforts of the Ecoles pratiques to grow at the expense of the higher primary schools, enterprising principals of municipal colleges were also trying to annex higher primary schools to their institutions. Although the higher primary schools grew rapidly during the interwar years, from 281 schools (for boys) in 1924 to 319 in 1938, one-third of them (99 in 1934) were attached to secondary schools, mainly to collèges, and were gradually absorbed by them after the elimination of tuition fees in the early 1930s.[7]

Thus, the three types of secondary schools were far from having been sealed off from each other; indeed, during the interwar years the differences began to break down as both the collèges and technical schools sought to grow at the expense of the higher primary schools. Clearly a new and more distinct form of sec-

3. *Ibid.* Also C.R. Day, "The Making of Mechanical Engineers in France: the Ecoles d'Arts et Métiers, 1803-1914", *French Historical Studies*, X (Spring 1978), pp. 439-60.
4. Note especially the Conseil supérieur de l'enseignement technique in the Commerce Ministry and the Association française pour le développement de l'enseignement technique, founded in 1902. L.M. Leroy, *Vers l'éducation nouvelle* (Paris, 1906); and *L'Education nationale au XX^e siècle* (Paris, 1914).
5. *Bulletin trimestriel de la Société amicale des anciens élèves des Ecoles nationales professionnelles* (hereafter *Bulletin des Ecoles professionnelles)*, (December 1928), pp. 200-1.
6. This figure includes closely related vocational schools like the *Ecoles de métiers*, special vocational schools, etc. J.P. Guinot, *Formation professionnelle et travailleurs qualifiés depuis 1789* (Paris: Domat, 1946), p. 283.
7. J.P. Briand, J.M. Chapoulie, and H. Peretz, "Les statistiques scolaires comme représentation et comme activité", *Revue française de sociologie*, XX (1979), pp. 669-702.

ondary education was emerging, but the only important reform introduced during the interwar period was the abolition of tuition in the lycées and collèges between 1929 and 1934, a reform which might have led to the democratization of secondary education, but did not.[8]

During the 1920s, the age of compulsory school attendance was raised from thirteen to fourteen for students in the primary system; this meant that pupils in higher primary sections in the collèges paid no tuition while their classmates, enrolled in the collège and taking the same courses, paid. This was the immediate reason for the progressive abolition of tuition fees in the secondary schools. But the main reason behind the end to fees was the fear among secondary school officials of declining enrolments during the lean years of the late 1920s, the *générations creuses* of the war.[9] As soon as the larger postwar generation reached high school age in the early 1930s, the lycées reimposed selection procedures, measures doubtless also influenced by cutbacks in professorships and grants as part of government austerity measures resulting from the Depression.

Now the abolition of fees had little effect on the higher primary schools and the technical schools in terms of numbers, but it did affect the quality of their recruitment. For the first time the best and brightest students from the primary system were oriented toward classical studies rather than toward modern and technical programs. Moreover, the end of fees suggested that in future secondary education might be unified in the lycées which meant the eventual disappearance of the higher primary and technical high schools. As the secondary schools had a very poor record of contributions to business, industry, and modern life in general, this prospect was greeted unenthusiastically by advocates of the modernization of secondary education.[10]

Those involved in intermediate technical education retreated into the typically defensive, Malthusian posture of the time, poaching on the students of their neighbours and seeking through lobbying and political action to increase their prestige by raising the level of programmes and diplomas and by preventing the creation of new schools. In the case of the Ecoles d'arts et métiers, they succeeded. In the case of the Ecoles professionnelles, they failed completely. Examining these two cases offers a means of gaining insight into the politics of technical education during the interwar years.

During the past 175 years, the Ecoles d'arts et métiers have passed through three stages. From 1802 to 1907, they were technical junior high and later high schools recruiting from among the sons of skilled workers, artisans, and small manufacturers for the most part. From 1907, when they were allowed to prepare

8. Briand, Chapoulie, and Peretz, "Les conditions institutionnelles de la scolarisation secondaire des garçons entre 1920 et 1940", *Revue d'Histoire moderne et contemporaine*, XXV (juillet-septembre 1979), pp. 391-421. See also John E. Talbott, *The Politics of Educational Reform* (Princeton: Princeton University Press, 1969).
9. Briand, Chapoulie, Peretz, "Les conditions", p. 408.
10. *Bulletin mensuel de la Société des anciens élèves des Ecoles d'arts et métiers* (hereafter *Bulletin des Arts et Métiers*), LXXXIX (July 1937), pp. 463-66.

for a diploma in mechanical engineering, to the end of World War II, they occupied an indeterminate position in the technical education hierarchy, somewhere between secondary and higher education. They recruited a growing percentage of their students (called *gadzarts*) from the higher primary schools and, as a result, a number of sons of farmers and rural artisans appeared among the older clientele of urban workers and manufacturers. Since 1945, the Ecoles d'arts et métiers have advanced to the university and then *grande école* level. In the process, they have attracted many more sons of businessmen, industrialists, and engineers, yet half their clientele is still of modest origin (the highest percentage of any *grande école*), mostly the sons of workers, employees, and technicians.[11] Hence the schools have been successful over the years in raising the status of their programmes, diplomas, and clientele. The professional advancement of their graduates, especially during the nineteenth century, contributed to the rise in prestige of the schools and came as a result of promotion on the job in the relative absence of competition from other schools training mechanical engineers and technicians. The graduates of the elite *Ecole polytechnique* (who worked mainly in the technical branches of the civil service and military) and of the *Ecole centrale* were not prepared to work their way up from the *boîte à fumer*, as the gadzarts called it, and thus they did not compete directly with them.[12]

Toward the end of the century, the Republic, alarmed by German progress in technical education, began to create many new technical and engineering schools whose graduates contested the middle and upper-middle technical positions in industry that the gadzarts had become accustomed to thinking of as their own.[13] This, and the decline of the older railway, machine construction, and metallurgical industries, in which the gadzarts had made their reputation, caused some unemployment and a decline in upward professional mobility. Their alumni association, organized in 1847, now became an increasingly well-organized, rich, and powerful lobby, using its influence in the Commerce Ministry to obtain the mechanical engineering diploma in 1907. After the establishment of Lille and Cluny at the turn of the century, it increasingly opposed the creation of more schools, but was not able to prevent the opening of Paris in 1912.[14]

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11. C.R. Day, "Mechanical Engineers", pp. 449-51; and Société des anciens élèves des Ecoles d'arts et métiers, "Sondage [sur] l'origine sociale des parents et grands-parents des élèves actuellement en 4ème année de l'ENSAM" (1975), on the *promotion* of 1974, available in the alumni association office, 9bis, Avenue d'Iéna, Paris 16e.
12. Arthur Morin and Henri Tresca, *De l'organisation de l'enseignement industriel et de l'enseignement professionnel*, second edition, (Paris, 1884). Also *Bulletin des Arts et Métiers*, XXXIII (September 1881), p. 494.
13. See Harry Paul, "Appollo courts the Vulcans", in *The Organization of Science*. See also Terry Shinn, "The French Science Faculty System 1808-1914: Institutional Change and Research Potential", *Historical Studies in the Physical Sciences*, X (1979), pp. 271-332.
14. Archives nationales (hereafter AN), F 17 14335, Aix-en-Provence; 14337, Lille; 14341, Cluny; and 14345, Paris.

In 1925 the alumni association, with a membership of fifteen thousand out of the sixteen thousand living graduates and hundreds of branch groups organized by region and industry, strongly opposed the decision of the Technical Education Division in the Ministry of Public Instruction to convert the technical school at Strasbourg into an Ecole d'arts et métiers. After parliament had voted the funds for the conversion of the school, the association reluctantly agreed on the condition that the annual intake of six hundred students did not change with the addition of a seventh school (each of the six schools had three hundred students spread over the three year course; thus together they had around eighteen hundred students, admitting six hundred new ones each year). The association also talked seriously about closing Cluny as a *quid pro quo* for Strasbourg.[15] The result of all this was that Strasbourg was never converted to an Ecole d'arts et métiers by the Technical Education Division. As was so often the case with the Republic during the interwar period, a decision once made was never applied.

With the coming of the Depression in France, the unemployment rate in the association jumped from an infinitesimal fifty-one members (of fifteen thousand) in 1930 to five hundred, or 2.5 per cent, in 1933.[16] Though this was not particularly high in comparison with unemployment rates in most fields, the association lobbied for a drastic cut in admissions to all of the schools. It argued that the Ecoles professionnelles were filling the role once played by the Ecoles d'arts et métiers in training skilled workers, foremen, draftsmen, and technicians for industry, and that the demand for engineers was far more limited than that for technicians. Thus the expansion of the Ecoles professionnelles, not the arts et métiers, was needed. The Technical Education Division of the ministry let itself be persuaded, and the number of students annually admitted to the six schools was cut from 600 to 360.[17] With the beginning of the arms race shortly thereafter, France badly needed mechanical engineers just when the arts et métiers, the principal supplier, had reduced its output by 40 per cent. By 1938, the schools could not fill the demand for its graduates. Yet when the executive of the association suggested to its branches that the annual quota of admissions might be raised slightly from 60 to 80 (360 to 480 students per year), they met with determined resistance, especially from the groups in the industrial departments of the northeast, where demand was highest.[18]

Despite continuing demand during and after World War II for graduates of the schools, the number of annual admissions was not raised to the level of the 1920s (six hundred) until 1956, when it was discovered that France had the same number of engineers that she had had forty years earlier and that the Ecoles d'arts et métiers, which in those days had been producing a quarter of the engineers of

15. *Bulletin des Arts et Métiers*, LXXXV (June, July, and December 1933), pp. 405, 508, and 799.
16. *Ibid.*, LXXXV (June 1933), pp. 406-7.
17. *Ibid.*, LXXXVII (December 1935), pp. 851-5.
18. *Ibid.*, XC (May and October 1938), pp. 4, 127-8.

the country, had dropped to a fifth by 1956.[19] In reply to growing public criticisms of Malthusianism, the association argued that the schools had had no choice but to reduce enrolments in view of the difficulty of finding qualified applicants. The increasing absorption of the higher primary schools by the collèges during the 1930s, with the subsequent orientation of the best students from the primary system toward classical studies, had deprived the arts et métiers of many of their best candidates.[20]

It is true that a third of the higher primary schools were absorbed by secondary schools during the 1930s, but the Ecoles pratiques grew substantially and were amalgamated with the remaining higher primary schools as *collèges techniques* in 1943. The Ecoles professionnelles, the main source of students for the arts et métiers, quadrupled in number between the wars. The tightening of selection procedures in the lycées and the continuing preference of village teachers and of many lower middle class families for the higher primary and technical schools, because of the clear-cut professional outlets which they offered, suggest that recruitment to the arts et métiers was not as weak as was claimed.[21]

The interwar years were generally ones of stagnation for the Ecoles d'arts et métiers. In 1914, six thousand gadzarts had been mobilized and sent indiscriminately to the front lines, where one thousand were killed in the first year (while *centraux* and *polytechniciens* were given special dispensation as necessary technical personnel).[22] When the politicians and generals finally were made to realize that they were slaughtering the young mechanical engineers and technicians who were indispensable to the fighting of a war of attrition, the gadzarts were recalled from the front. By 1916, they had become the technical directors of all six major airplane companies and of many other arms firms.[23] The excellent French performance from 1915 to 1918 in gearing their economy for wartime production was partially due to their technical and managerial skills.

Thus, after the war, gadzarts enjoyed a prestige unparalleled in their history. The schools were rebuilt and retooled, programmes improved, and graduates allowed easier entry into almost all of the higher technical schools. They soon formed the largest corps of students at the *Ecole supérieure d'électricité* and a capable group at the *Ecole centrale*.[24] Unfortunately, the very ambitions of the schools and of their alumni association played a role in weakening them. For example, Edmond Labbé, the director of the Technical Education Division in the Ministry of Public Instruction from 1920 to 1934, advocated a *culture générale technique* for the technical schools as a means of enhancing their public appeal.[25]

19. *L'Ingénieur des Arts et Métiers* (replaced the *Bulletin des Arts et Métiers* in 1939), XVIII (April 1957), pp. 28-30. In 1963, a seventh school was opened at Bordeaux, cf. XXIV (January 1963), pp. 41-9; XXV (October 1964), pp. 35-53.
20. *Ingénieur des Arts et Métiers*, XIII (April-May 1952), pp. 29-30.
21. *Ibid.*, XIX (November 1958), pp. 117-22.
22. *Bulletin des Arts et Métiers*, LXXIII (September 1921), p. 610.
23. *Bulletin des Arts et Métiers*, LXXXVII (December 1935), pp. 851-6; *Ingénieur des Arts et Métiers*, XXVII (October 1966), pp. 27-42.
24. *Bulletin des Arts et Métiers*, LXXIX (January 1927), pp. 15-6.
25. *Ibid.*, LXXXIV (May 1932), pp. 153-62.

The alumni association, always anxious to improve the image of the schools, enthusiastically supported him against the vigorous dissent of those favoring the old rough and ready ways.[26] The result was the introduction of a mishmash of liberal arts and modern language courses which overloaded programmes to the point where the students were spending twelve hours a day in classroom, workshop, and study hall. In the meantime, their programme continued to lag behind advances in industrial technology. By the late 1930s, graduates of the schools were doing less well in the entrance examinations for the higher schools than they had done in the 1920s.[27]

The very conception of the arts et métiers was in need of redefinition, for it was not clear whether they were university technical institutes or secondary schools. In such a situation, the nature of their recruitment and the value of their diploma were uncertain. What was needed was nothing less than the complete reorganization of the outdated tripartite structure of intermediate education and a redefinition of its relationship to higher education. By failing to modernize the educational system, the Republic left existing institutions little choice save to fall back on a sterile defence of *positions acquises*.

Vichy took the first step in 1943 by creating the *collèges techniques* out of the higher primary schools and Ecoles pratiques. Two years later, in 1945, the Liberation regime created *lycées techniques* preparing for a new *baccalauréat technique*.[28] It then completely reformed the Ecoles d'arts et métiers, placing them squarely at the university level. Henceforth they recruited from an *année préparatoire* in the lycées techniques and in the Ecoles professionnelles, and also from the science sections of the classical lycées. Their programme was extended from three to four years by turning the five provincial campuses into regional centres teaching the first three years and preparing for a fourth year in Paris which united all the students in one central prestige centre. The school was given a single name, the *Ecole nationale supérieure des arts et métiers* and, in the 1970s, was fully assimilated to the *grandes écoles*.[29]

Today, the Ecoles d'arts et métiers continue to train mechanical engineers for industry but, in the space age, the conception, design, and manufacture of machines has become a highly complicated process. While at school the gadzart studies advanced physics, chemistry, and mathematics, with special emphasis on the structure and resistance of materials, sources of energy, electricity, and electronics. They also study industrial organization and techniques, foreign languages, and some liberal arts.[30] One-third of the graduates work in the machine construction industries; the remainder about equally in metallurgy, chemistry and petrol, electricity and electronics, building and construction, transportation and communications, and the public and military services. The big gain has been in

26. Paul Popin, *Les Gadzarts* (Paris, 1947), pp. 163-238.
27. *Bulletin des Arts et Métiers*, XC (November 1938), pp. 153-4.
28. *Technique, Arts, Sciences*, 19 (April 1948), pp. 11-7; 277-78 (1974), pp. 8-68.
29. *Ingénieur des Arts et Métiers*, IV (April and June 1970), pp. 9-12, 21-6.
30. ENSAM, *Visa pour l'Avenir*, 1975 (brochure).

the new, high technology industries (space, medical technology, etc.); the big drop has been in transport (railways), which has fallen from 17 to 5 per cent.[31]

According to an alumni association survey of the mid-1970s, 8 per cent of the members of the organization (comprising almost all graduates) are company directors, presidents and regional managers; 35 per cent are chief engineers and heads of divisions; and 57 per cent are ordinary engineers (of whom 60 per cent are young).[32] This indicates that today, as a century ago, the average graduate may look forward to becoming a chief engineer, plant supervisor, or divisional manager — upper middle-level positions. Relatively few become company presidents or directors. Gadzarts used to bypass the log-jam at the top by going into business for themselves, often manufacturing their own inventions. But the ever-increasing concentration of industry makes this difficult.

Ironically, all the gains in programmes, diplomas, and prestige over a century and a half have really only enabled the gadzarts to stay even in the industrial hierarchy against growing competition from newer technical and engineering schools. The growing tendency since World War II of engineers from the Ecole polytechnique, and its affiliates mines and ponts-et-chaussées, to parachute from secure positions in the state technical corps into top positions in business and industry (*pantouflage*) has further closed avenues to the top.[33] Thus, if the gadzart no longer begins his career in workshop and drafting room — the *boîte à fumer* — he seldom rises to the top either. As a graduate of a lesser *grande école*, he is in demand for well-paying engineering positions, but his professional opportunities are more circumscribed than they used to be and the challenges are perhaps less exciting. But at least a century of lobbying has enabled him to hold his place in the competitive world of the French educational establishment, an establishment which limits individual initiative and seeks to define professional advances through a complicated set of legally defined privileges to which a diploma from a *grande école* entitles its bearer.

While the Ecoles d'arts et métiers have managed to defend their position over the past 175 years, the Ecoles nationales professionnelles have not been as fortunate. Ranking just below the former in the technical education hierarchy, they were created more recently, during the 1880s and 1890s, and their alumni association never became the rich pressure group characteristic of those of the higher engineering schools. By 1935, only 6,500 of an estimated 25,000 living graduates belonged to it.[34]

The four original Ecoles professionnelles — "les quatre vieilles" at Vierzon, Voiron, Armentières, and Nantes — were originally higher primary professional schools training skilled workers and foremen.[35] During the interwar period, they

31. *Ibid.*
32. *Ibid.*
33. *Ingénieur des Arts et Métiers*, XXXIV (April 1973), pp. 17-9; and Ezra Suleiman, *Elites in French Society* (Princeton: Princeton University Press, 1978), pp. 111-7.
34. *Bulletin des Ecoles professionnelles*, 170 (November 1936), p. 292.
35. *Ibid.*, 167 (August 1936), p. 186; and AN F 17 14340-14356, Ecoles nationales professionnelles.

gradually succeeded the Ecoles d'arts et métiers as technical high schools training technicians and managers. Aside from a period of unemployment between 1932 and 1935, which reached a peak of 4 per cent in 1934, the graduates had no trouble finding jobs and usually were sought after.[36]

Because of the demand for their graduates, the technical education administration in the Ministry of Public Instruction continued to open new Ecoles professionnelles. During the first part of the 1920s it converted four of the strongest Ecoles pratiques at Epinal, Lyon, Saint-Etienne, and Tarbes into Ecoles professionnelles and also assimilated the two Ecoles d'horlogerie at Besançon and Cluses to them. Suddenly, there were ten rather than four schools, and this awakened fears of being swamped by the less prestigious Ecoles pratiques.[37] Grudgingly, the alumni association accepted the graduates of the six new schools into its ranks, but it used all its influence to prevent the creation of any more schools. Thus, when in the late 1920s, the administration opened three new ones, including one for young women at Bourges, this was the last straw. The association refused to admit their graduates into its ranks, a schism which was not closed until 1936. By 1938, another three schools had been established over the protests of the association, bringing the number to sixteen (nine thousand students). When in 1959 the Billières Law merged them into the system of lycées techniques, they numbered thirty-two schools with 18,500 students, up from 10,000 in 1946.[38] As lycées techniques they have gradually lost their separate identity, and their alumni association now represents technicians generally.[39]

During the interwar years, therefore, France made modest gains in technical education. The number of students in the Ecoles pratiques grew from fifteen thousand in 1913 to sixty thousand in 1938, and the Ecoles professionnelles from eighteen hundred in 1913 to nine thousand in 1938.[40] On the other hand, the number in the Ecoles d'arts et métiers declined from eighteen hundred to one thousand in 1938. There were also some gains made in continuing education: the Astier law of 1919 set the stage for compulsory part-time education for young workers, but was never fully implemented between the wars. The creation of *Centres d'apprentissage* in 1938 for training and retraining workers was important, but these were only fully developed under Vichy and the Fourth Republic and were later assimilated to the *collèges techniques*.[41]

By the Liberation, therefore, the key decisions concerning the future of secondary education had yet to be made. Was French secondary education to become a unitary democratic system based on the *école unique* or was it to continue

36. *Bulletin des Ecoles professionnelles*, 146 (November 1934), pp. 227-8; and 184 (January 1938), pp. 10-1.
37. *Ibid.*, 70 (July and December 1928), pp. 114-5.
38. *Ibid.*, 94 (July 1930), p. 109; 167 (August 1936), pp. 186-203; and 7 (January 1947), p. 36.
39. *Ibid.*, 39 (May-June, 1958), pp. 27-34; 3 (May 1959), pp. 25-8; and 15 (May 1961), pp. 33-4. Société amicale nationale des techniciens et techniciens supérieurs, brevetés des lycées techniques et des anciens élèves des Ecoles nationales professionnelles.
40. J.P. Guinot, *Formation professionnelle*, pp. 278-84.
41. *Ibid.*, pp. 190-237.

to be based on separate classical, modern, and technical streams. If so, what was to be done to place the three streams on a level of equality with each other? The Wallon-Langevin Commission recommended the extension of the school-leaving age from fourteen to sixteen and a common programme of studies until age fifteen, which implied the merging of the intermediate schools into a unified system of high schools. But the commission also favored the provision of vocational training for those who needed it.[42] The solution was to establish an orientation cycle of four years for students aged eleven to fifteen, based on a *tronc commun* or common corps of studies. This programme was to be given between the ages of eleven and fifteen in three different types of secondary school — classical, modern, and technical — with professional or university preparation beginning thereafter. Hence, there was to be no comprehensive school uniting all secondary school-age students under one roof. The French were too attached to their old habit of special schools for special purposes for special people to make such a fundamental change.

The new system of technical collèges and lycées and the technical baccalauréat created in 1945 placed the technical high schools on a level of theoretical equality with the classical and modern secondary schools. This opened the doors to all branches of higher education. The technical colleges absorbed the Ecoles pratiques and later the Centres d'apprentissage and had 630,000 students by 1974.[43] They trained the great majority of their students directly for skilled manual and clerical jobs in business and industry. The technical lycées prepared skilled technicians for industry and candidates for the higher engineering schools (arts et métiers, centrale, science faculties, etc.). In 1959, they absorbed the Ecoles nationales professionnelles and the more important technical collèges.[44] As has been mentioned, the programmes of the arts et métiers were upgraded to the university level for which the technical lycées mainly prepared.

Under the Third Republic, there were about seventy-five thousand students in the schools under the Technical Education Division of the Ministry of Public Education. Today there are over 800,000.[45] Critics on the left continue to argue that the technical-vocational schools provide a dumping ground for the "less intelligent", that is, the working class youth, while proponents of technical education, who tend to be on the right-centre politically, point out that the elaborate orientation facilities in the departments provide careful vocational testing and counselling to ensure that each child receives the kind of secondary education for which he is most suited.[46] When mistakes are made or decisions reconsidered, there are ample means of transfer from one kind of secondary school to another.

French technical high schools and universities are well-financed. Their professors are trained in special normal schools, the schools are well-equipped, and their programmes, if sometimes overloaded, are generally well-conceived. In view

42. *Technique, Arts, Sciences*, 204 (December 1966), pp. 1-10.
43. *Ibid.*, 277-78 (1974), pp. 8-71.
44. *Bulletin des Ecoles professionnelles*, III (May 1959), pp. 25-8.
45. *Technique, Arts, Sciences*, 277-78 (1974), pp. 34-6.
46. *Ibid.*, 204 (December 1966), pp. 1-10.

of the rapidity of technological change, they stress adaptation rather than specialization and diversity rather than uniformity.

Today the technical high schools are no longer the outcasts of the educational system, but if anything its spoiled darlings. This too creates problems, for there are far too many diplomas, options, councils, boards, committees, study groups, and orientation centres, and generally far too much bureaucracy and centralization for the system to be fully flexible and up to date. Indeed, if many in the Fifth Republic had their way, the technical schools would become the core of the secondary and university curriculum and the educational system little more than an extension of the economy (namely, the Haby reforms which barely failed to pass a few years ago). This, and the increasing preoccupation of young people today with careers, make ever more possible the realization of the old nineteenth-century dream of the advocates of technical education of a *Université du Travail* competing with and eventually replacing the older Napoleonic *Université*.[47] Arago once expressed their thinking when he said in the 1830s: "Ce n'est pas avec de belles paroles qu'on fait du sucre de betterave; ce n'est pas avec des alexandrines qu'on extrait la soude du sel marin"; and the gadzarts liked to say: "On vit de bonne soupe et non de belles paroles."[48] Today the academic mandarins of the old *Université* fall deeper into a mood of gloom and doom as their empire crumbles before the modernization of French education and of the economy. The debate between the ancients and moderns continues in ever-changing form, but for the first time in a century and a half it favors the moderns.

47. *Ibid.*, 283-84 (1974), pp. 31-3.
48. The Arago quote of 1836 is in AN, F 17 14345, Conseil général de la Seine, 1904. The other is in the *Bulletin des Arts et Métiers*, XXVIII (February 1892), 122-7.